

REMARKS

Claims 1 to 8 are pending. Claims 1 and 4 are hereby amended.

§102 Rejections

Claims 1, 4 and 5 were rejected under 35 U.S.C. 102(b) as being anticipated by Wensel et al (US 6,291,899) (referred to hereinafter as “Wensel”).

The Office Action essentially states that:

- Regarding claim 1, Wensel et al. discloses in e.g., Fig. 4A a laminated flip-chip interconnect package (a package 36 in Fig. 4A and column 4, line 46) comprising
- a substrate (24; column 3, lines 38-39) having a chip attach surface (the top surface of the substrate 24 where the chip 26 is attached) and an opposing board attach surface (the bottom surface of the substrate 24; column 4, lines 64-65) that define contact pads (the pads under the solder ball 38 and pads on the top surface of the substrate 24 that are connected to the wire 30) for attachment to corresponding pads on the chip (26; column 3, line 40) and board (board; column 4, lines 64-65),
 - wherein the board attach surface (at the bottom surface of the substrate 24) comprises
 - a pattern of contact pads (the pads under the solder ball 38) opposite and “adjacent” a chip attach location (the area on the substrate 24 where the chip 26 is attached) on the chip attach surface except at least one solid plane area (at the area of the element 44; column 4, line 46) on the board attach surface,
 - said solid plane area (at the area of the element 44) being “adjacent” to a corner of chip attach location (see Fig. 4A), and
 - said board attach surface comprising a dielectric material (44; column 5, lines 5-7).
- Regarding claim 4, Wensel et al. discloses in e.g., Fig. 4A a laminated flip-chip interconnect package (a package 36 in Fig. 4A and column 4, line 46) comprising
- a substrate (24; column 3, lines 38-39) having a chip attach surface (the top surface of the substrate 24 where the chip 26 is attached) and an opposing board attach surface (the bottom surface of the substrate 24; column 4, lines 64-65) that define contact pads (the pads between the solder ball 38 and the substrate 24, and pads on the top surface of the substrate 24 that are connected to the wire 30) for attachment to corresponding pads on the chip (26; column 3, line 40) and board (board; column 4, lines 64-65),
 - wherein the board attach surface (at the bottom surface of the substrate 24) comprises
 - at least one solid plane area (at the area of the element 44; column 4, line 46),
 - said area (at the area of the element 44) being opposite a chip attach surface region adjacent at least one corner of a chip attach location (see Fig. 4A), and
 - said board attach surface comprising a metal (44; column 5, lines 5-7).
- Regarding claim 5, Wensel et al. discloses in e.g., Fig. 4A said metal being copper (copper 44; column 5, lines 5 - 7).

Applicants have amended claims 1 and 4 to clarify that the solid plane area is an unpatterned area of the board attach surface. This amendment is supported by the specification at, e.g., p. 14, lines 12-13.

Applicants submit that according to MPEP 2131 “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” (citing *Verdegall Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)).

Applicants respectfully submit that, as stated in the Office Action, board attach surface is the bottom surface of substrate 24. Element 44 is not a part of the board attach surface, but is a stabilizing plate. *See* Wensel, e.g., at col. 4, lines 44-46. Wensel does not disclose a board attach surface comprising a pattern of contact pads opposite and adjacent to a chip attach location on the chip attach surface except at least one unpatterned solid plane area of the board attach surface, said unpatterned solid plane area being adjacent to a corner of a chip attach location. Accordingly, the reference does not describe every element of the claimed invention.

For these reasons, Applicant(s) submit that the cited reference will not support a 102(b) rejection of the claims invention and request that the rejection be withdrawn.

§ 103 Rejections

Claims 2, 3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wensel in view of Jacobs (U.S. 6,294,407).

The Office Action essentially states:

Regarding claims 2, 3, 6 and 7, while Wensel et al. discloses the use of the solid material (i.e., the dielectric or metal) on a solid plane area, Wensel et al. does not disclose a coverlay material. Jacobs teaches in e.g., Fig. 8 a solid material on a solid plane area (810; column 11, lines 28) being covered with a layer of a coverlay material (epoxy 130; column 7, lines 55-58). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the coverlay material (e.g., epoxy) to cover the solid material (e.g., the dielectric or metal) on the solid plane area of Wensel et al. as taught by Jacobs to prevent short circuits between conductive bumps (column 8, lines 2-4).

Regarding claim 8, Wensel et al., as modified, discloses a solder mask (130 of Jacobs) having a plurality of openings (132 of Jacobs) defining ball grid array pads.

Applicants respectfully submit that according to MPEP 2142, to establish a case of *prima facie* obviousness, three basic criteria must be met: 1) there must be some suggestion or motivation, either in the references or generally known to one skilled in the art, to modify or combine reference teachings, 2) there must be reasonable expectation of success, and 3) the prior art references must teach or suggest all the claim limitations. The ability to modify the method of the references is not sufficient. The reference(s) must provide a motivation or reason for

making the changes. *Ex parte Chicago Rawhide Manufacturing Co.*, 226 USPQ 438 (PTO Bd. App. 1984).

Applicants incorporate by reference their response, above to the 102(b) rejection based on Wensel and submit that the combination of Jacobs with Wensel does not overcome the deficiencies of Wensel as a prior art reference. Furthermore, Applicants respectfully submit that the references cannot support a case of *prima facie* obviousness as to the claims because, among other possible reasons, the cited references do not provide a motivation or suggestion for applying a coverlay to a dielectric board attach surface because element 810 of Jacobs is not a board attach surface, but is an elastomeric stress buffer provided within dielectric adhesive layer 130, which adhesive layer is used to attach thin film decal 110 to second level substrate 120. See Jacobs at, e.g., col. 6, lines 27-30 and col. 11, lines 22-30. In addition, these references do not disclose all the elements of the present invention because they do not disclose a coverlay on a dielectric board surface or a board attach surface having at least one unpatterned solid plane area.

For these reasons, Applicant(s) submit that the cited references will not support a 103(a) rejection of the claims invention and request that the rejection be withdrawn.

In addition to the foregoing arguments, Applicant(s) submit that a dependent claim should be considered allowable when its parent claim is allowed. *In re McCarn*, 101 USPQ 411 (CCPA 1954). Accordingly, provided the independent claims are allowed, all claims depending therefrom should also be allowed.

Based on the foregoing, it is submitted that the application is in condition for allowance. Withdrawal of the rejections under 35 U.S.C. 102(b) and 103(a) is requested. Examination and reconsideration of the claims are requested. Allowance of the claims at an early date is solicited.

The Examiner is invited to contact Applicant(s)' attorney if the Examiner believes any remaining questions or issues could be resolved.

Respectfully submitted,

July 20, 2006
Date

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